Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD L. SCHANK, WILLIAM W. LIMBURG and
DALE S. RENFER

Appeal No. 1998-0847
Application No. 08/483,762

ON BRIEF

Before GARRIS, WALTZ and DELMENDO, **Administrative Patent Judges**.

WALTZ, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 4, 6 through 10, 12 through 16 and 22.[1] The remaining claims in this

[1]Appellants' amendment to claims 13 and 15 filed subsequent to the final rejection was entered by the examiner (see the amendment dated Mar. 20, 1997, Paper No. 13, entered as per the Advisory Action dated Apr. 8, 1997, Paper No. 14).

application are claims 17 through 20, which stand allowed by the

examiner (see the Advisory Action dated June 19, 1997, Paper No. 17, pages 1-2).

According to appellants, the invention is directed to an imaging member comprising a charge generation layer and a contiguous charge transport layer where the transport layer comprises specified diamine and methane compounds, with addition of the methane compound reducing or eliminating image blurring and significantly reducing squeak caused by cleaning of the image member drum with a cleaning blade (Brief, page 2). Appellants state that the claims should be grouped in two groups and "the rejected claims within each Group will stand or fall together." Brief, page 3. Appellants present reasonably specific, substantive reasons for the separate patentability of each group (Brief, pages 5-12). Accordingly, we select claim 1 from Group I and claim 13 from Group II and decide this appeal as to the ground of rejection on the basis of these claims alone, to the extent

the claims are separately argued by appellants. See 37 CFR § 1.192(c)(7)(1995). A copy of illustrative claims 1 and 13 is attached as an Appendix to this decision.

The examiner has relied upon the following references as evidence of obviousness:

Pai et al. (Pai)	4,297,425	Oct. 27, 1981
Oki et al. (Oki)	4,825,249	Apr. 25, 1989
Frankel et al. (Frankel)	5,117,264	May 26, 1992

Borsenberger et al. (Borsenberger), *Organic Photoreceptors for Imaging Systems,* 6-17, 181-195 and 200-201, Marcel Dekker, Inc., New York, 1993.

Claims 1-4, 6-10, 12-16 and 22 stand rejected under 35 U.S.C. § 103 as unpatentable over Pai in view of Borsenberger and Oki or Frankel (Answer, page 4).[2] We *affirm*

[2]The examiner incorrectly lists claims 17-20 as rejected claims and omits previously rejected claim 22 in the stated rejection on page 4 of the Answer. However, in view of the Advisory Action dated June 19, 1997, Paper No. 17, listing claims 17-20 as allowed, appellants' correct listing of the claims allowed and rejected (Brief, page 1, part c), and the examiner's correct listing of the claims on page 2, part (7), of the Answer, we deem the examiner's error on page 4 of the Answer harmless. Accordingly, the claims in the rejection before us are claims 1-4, 6-10, 12-16 and 22.

the examiner's rejection essentially for the reasons set forth in the Answer and the reasons below.

OPINION

The examiner finds that Pai discloses an imaging member having a charge generating layer overcoated with a charge transport layer where this transport layer includes a

N,N'-diphenyl-N,N'-bis(3-methylphenyl)-(1,1'-biphenyl)-4,4'-diamine (the diamine compound) and bis(4-diethylamino-2-methylphenyl)phenylmethane (the methane compound) in a polycarbonate resin (Answer, page 4). The examiner further finds that Pai teaches the addition of the methane compound for reduction of the "cycle down" problem caused by exposure to UV light, with use of any amount of the compounds that permit reduction of the effect of UV light on the imaging member although the preferred ratio is from 0.0005:1 to 0.1:1 (*id.*).

The examiner finds that Pai does not disclose the imaging member in cylindrical [drum] form in a system with a cleaning blade, as required by claim 1 on appeal (Answer, page 5).

Accordingly, the examiner applies Borsenberger for the disclosure of xerographic processes where the photoreceptor is in the form of a drum and cleaned by blades (*id.*).[3]

For the Group I claims, the examiner concludes that it would have been obvious to use the imaging member of Pai in the system

disclosed by Borsenberger because it is a known and commercially used construction (*id.*). For the Group II claims, the examiner
concludes that it would have been obvious to optimize the amount of diamine and methane compounds needed in order to achieve the results desired by Pai, noting that there is only a slight variation between the preferred upper limit of Pai (0.1:1) and the lower limit of claim 13 on appeal (at least 0.12:1)(see the Answer, page 6). We agree.

Appellants argue that Pai does not teach the imaging

[3]The examiner applies Oki and Frankel for evidence that polyurethane blades were well known in the art (Answer, page 5). Since this limitation does not appear in the claims under consideration, we need not discuss Oki and Frankel (see claim 4 on appeal). Furthermore, appellants disclose that "typical" cleaning blade materials include polyurethane (specification, page 10, ll. 18-21).

member in the form of a drum, nor use of the imaging member with a cleaning blade (Brief, page 4). Appellants' argument is not well taken since the examiner finds that Pai discloses that the charge transport layer is placed contiguously on a charge generating layer which in turn is on a support (Answer, page 4). Pai specifically teaches that this support or substrate may include drums (col. 3, ll. 11-12). Furthermore, in view of the teachings of Borsenberger that "[d]rums are widely used for low-volume copiers and printers" (page 6) and "[l]ow-volume copiers usually
use metal or polymeric blades [for photoreceptor cleaning]" (page

16), it would have been well within the ordinary skill of one in the art to use cleaning blades with the drum imaging member of Pai.

Appellants argue that none of the applied references address the problem of "squeak" nor offer a solution to this problem (Brief, pages 5-6). As noted by the examiner (Answer,

paragraph bridging pages 7-8), the motivation in the prior art to combine the references does not have to be identical to that of appellants to establish obviousness. *See In re Kemps,* 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996), citing *In re Dillon,* 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990)(in banc). Appellants further argue that *Dillon* is not dispositive since here the *prima facie* case of obviousness has been overcome by a showing of unexpectedly superior results (Brief, page 6). This argument is not well taken since we do not consider the evidence of unobviousness (i.e., the showing of allegedly unexpected results) until **after** a case of *prima facie* obviousness has been established. *See In re Oetiker,* 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Accordingly,

Kemps and *Dillon* refer to the motivation to combine references to establish *prima facie* obviousness and are dispositive on this point.

Appellants also argue that the specific claimed

combination of charge transport layer and cleaning blade would not have been obvious given the numerous possible combinations of charge transport layers and cleaning methods available at the time the invention was made (Brief, page 7; Reply Brief, pages 1-2). This argument is not persuasive in view of the teachings of Borsenberger and Pai noted above, namely that drums were suggested by Pai while Borsenberger teaches that blades were usually used to clean drum type copiers (see pages 6 and 16). Accordingly, the possible combinations suggested by the applied prior art were limited and not excessively numerous.

For the foregoing reasons and those set forth in the Answer, we determine that the examiner has presented a case of *prima facie* obviousness against the subject matter of claim 1 in view of the reference evidence. Appellants submit that the claimed invention shows unexpectedly superior results (Brief, pages 7-11;

Reply Brief, pages 2-5). Accordingly, we must reevaluate the evidence of *prima facie* obviousness in light of the evidence of non-obviousness. *See In re Oetiker,* 977 F.2d at 1445, 24 USPQ2d at 1444.

Appellants rely on the results shown in Tables 1-3 of the specification as a showing of unexpectedly superior results (Brief, page 7). We do not agree that this showing is sufficient to overcome the evidence of *prima facie* obviousness for the following reasons.[4] First, appellants admit that the difference in results between the Comparative Example and Examples I and II of the invention are significant only for temperatures between 35 and 50EC. (Brief, page 7). However, claim 1 on appeal is not limited to any temperature. Therefore the results presented are not commensurate in scope with the subject matter sought to be patented. *See In re*

[4]Appellants submit two Declarations under 37 CFR § 1.132 by Limburg in conjunction with extensive arguments regarding the methodology used in producing the results summarized in Tables 1-3 of the specification (see the Brief, pages 7-11; Reply Brief, pages 2-5). The examiner presents countervailing arguments regarding the testing procedure (Answer, pages 11-12). In view of the deficiencies in the showing noted *infra,* we need not discuss the testing procedure except to note that use of one subject to determine a noise level (i.e., "squeak") would not be entirely subjective but would merely be a factor in weighing the preponderance of the evidence in an obviousness determination.

Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219

(CCPA 1980). Furthermore, the weight of the compounds used in the Examples in the specification are not commensurate in scope with the unlimited weight ratios included within the scope of claim 1 on appeal (see the Answer, page 10). Secondly, all variables except the one sought to be shown superior are not fixed, thus the cause and effect is lost. *See In re Dunn,* 349 F.2d 433, 439, 146 USPQ 479, 483 (CCPA 1965). The amounts of each component in Examples I and II of the invention differ from the amounts used in Comparative Example 1 and thus the variance in squeak cannot be attributed only to the difference in compounds in the charge transport layer (compare Comparative Example I on pages 10-11 of the specification with Examples I and II on page 12 of the specification). Third, the comparison is not with the closest prior art. *See In re Burckel,* 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979). The primary reference to Pai includes Examples where only the diamine compound is in the transport

layer (see Examples I-V) but also presents Examples where the diamine compound is stabilized by the addition of a methane compound to produce beneficial results (see Examples VI and VII). Therefore the Comparative Example in appellants' specification where only the diamine compound is present is not representative of the closest prior art (Pai).

Based on the totality of the record, giving due consideration to appellants' arguments and evidence, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103. Accordingly, the examiner's rejection of claim 1, and claims 2-4, 6-10, 12 and 22 which stand or fall with claim 1, under 35 U.S.C. § 103 over Pai in view of Borsenberger and Oki or Frankel is affirmed.

The claims in Group II do not require a drum configuration or a cleaning blade but specify that the weight ratio of the methane compound to the diamine compound "is at least 0.12:1." See claim 13 on appeal. Therefore appellants

do not submit that unexpected results need to be shown since it is argued that the examiner has not presented a case of *prima facie* obviousness (Brief, page 12; Reply Brief, pages 5-6). Appellants argue that the maximum weight ratio limit taught by Pai is 0.1:1 while the

claimed lower weight ratio limit is 20% greater, i.e., there is no "slight increase" (*id.*).

Appellants' argument is not persuasive. We agree with the examiner that Pai teaches generically that "[t]he [methane] compound may be employed *in any amount* which will inhibit or greatly minimize the deleterious effects of UV light on the charge transport diamine compound." See Pai, col. 5, ll. 57-60, emphasis added. Pai further teaches that it is generally *preferred* that the maximum weight ratio be 0.1:1 (col. 5, ll. 60-62). A reference must be considered, under section 103,

not only for what it expressly teaches but also for what it fairly suggests. All disclosures of the prior art must be considered in determining obviousness. *See In re Burckel,* 592 F.2d at 1179, 201 USPQ at 70. Furthermore, as held by our reviewing court:

> Nor can patentability be found in the difference in carbon monoxide ranges recited in the claims. The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. [Citations omitted]. These cases have consistently held that in such a situation, the applicant must show that the particular range is *critical,* generally by showing that the claimed range achieves unexpected results relative to the prior art range. [Citations omitted]. *In re Woodruff,* 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

In view of the teachings of Pai, we determine that the examiner has presented a *prima facie* case of obviousness regarding claim 13 on appeal, with claims 14-16 standing or falling with claim 13. In this situation, appellants have not proffered any showing of unexpected results for the weight ratio ranges claimed.

Therefore, based on the totality of the record, giving due consideration to appellants' arguments, we determine that the

preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103. Accordingly, the examiner's rejection of claims 13-16 under 35 U.S.C. § 103 over Pai in view of Borsenberger and Oki or Frankel is affirmed.

For the foregoing reasons and those set forth in the Answer, the examiner's rejection of the claims on appeal under 35 U.S.C. § 103 over Pai in view of Borsenberger and Oki or Frankel is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

BRADLEY R. GARRIS Administrative Patent Judge	)	
THOMAS A. WALTZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ROMULO H. DELMENDO Administrative Patent Judge	)	

taw/vsh

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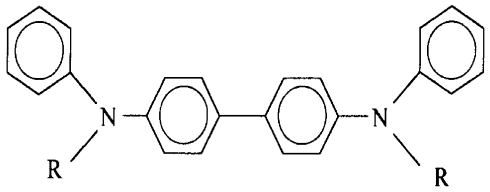
APPENDIX A
Claims 1 and 13

1. An electrophotographic imaging system comprising:

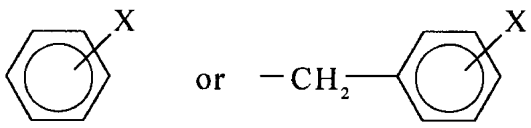
(a) an imaging member drum comprising a charge generation layer and a contiguous charge transport layer, said charge transport layer being homogeneous and comprising:

(1) a diamine compound of formula (I):



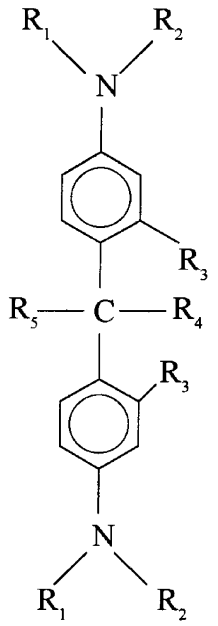
(I)

wherein R is



and wherein X is independently selected from the group consisting of alkyl having from 1 to about 4 carbon atoms and chlorine in the ortho, meta or para position, and

(2) a methane compound of formula (II):



(II)

wherein R_1, and R_2 are independently selected from the group consisting of alkyl having 1 to 8 carbon atoms, aryl, alkaryl and aralkyl, where said aryl is a phenyl group or a condensed ring group, and where the alkyl group of said alkaryl and aralkyl has 1 to 4 carbon atoms;

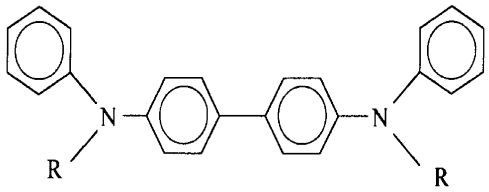
R_3 and R_4 are independently selected from the group consisting of hydrogen and CH_3; and

R_5 is selected from the group consisting of alkyl having 1 to 8 carbon atoms, aryl, alkaryl, aralkyl, and disubstituted aminophenyl group having substituents independently selected from the group consisting of alkyl having 1 to 8 carbon atoms, aryl, alkaryl and aralkyl, where each said aryl is a phenyl group or a condensed ring group, and each said alkyl group of each said alkaryl and aralkyl has

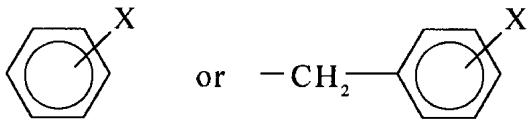
1 to 4 carbon atoms; and

(b) a cleaning blade that comes into contact with the charge transport layer.

13. An imaging member comprising a charge generation layer and a contiguous charge transport layer, said charge transport layer being homogenous and comprising:



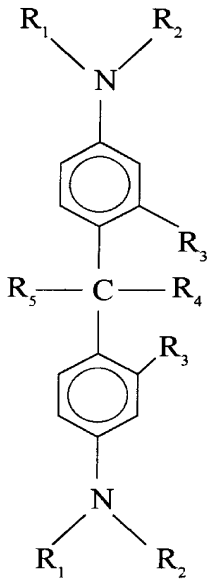
(1) a diamine compound of formula (I):

(I) 

wherein R is

and wherein X is independently selected from the group consisting of alkyl having from 1 to about 4 carbon atoms and

chlorine in the ortho, meta or para position, and

(2) a  compound of formula (II):

wherein R_1, and R_2 are independently selected from the group consisting of alkyl having 1 to 8 carbon atoms, aryl, alkaryl and aralkyl, where said aryl is a phenyl group or a condensed ring group, and where the alkyl group of said alkaryl and aralkyl has 1 to 4 carbon atoms;

R_3 and R_4 are independently selected from the group consisting of hydrogen and CH_3; and

R_5 is selected from the group consisting of alkyl having 1 to 8 carbon atoms, aryl, alkaryl, aralkyl, and disubstituted aminophenyl group having substituents independently selected from the group consisting of alkyl having 1 to 8 carbon atoms, aryl, alkaryl and aralkyl, where each said aryl is a phenyl group or a condensed ring group, and each said alkyl group of each said alkaryl and aralkyl has 1 to 4 carbon atoms;

wherein a weight ratio of said compound of formula (II) compound to said diamine compound of formula (I) is at least 0.12:1.